CHILTON'S

AUTOMOTIVE INDUSTRIES

AUGUST 1991

TOHI SUPPLIER PROFILE ISSUE

THE PEOPLE - THE PROCESS

Who Will Replace GM's Design Czar?

Charles 'Chuck' Jordan
VP Design Staff

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In only 18 months GM's Chuck Jordan retires. Page 26. Cover Photography: Rob Johns

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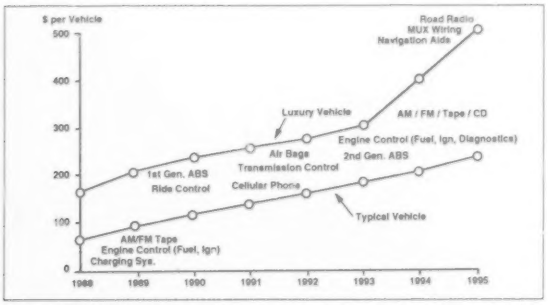
by LINDSAY BROOKE

NEW HORIZONS

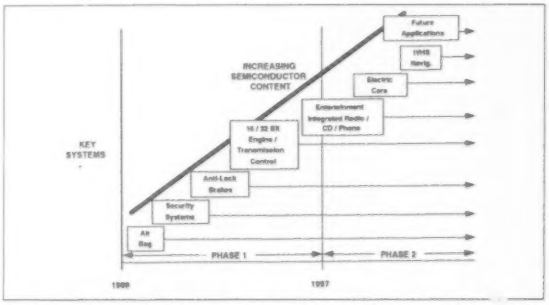
Motorola maps out the future of automotive electronics and sums it up in one word: Speed. But there's a lot more coming.

What's the number one challenge in automotive electronics today? "Well, that's easy," says Greg Williams, vp of Motorola's automotive semiconductor group. "I can sum it up in one word: Speed."

Cost, he says, is certainly an important consideration. But speed, both in product development cycles and product performance, is the main concern for Motorola (which currently supplies



Average North American vehicle semiconductor content, through 1995



Systems roadmap: more automotive semiconductors, 1997 and beyond

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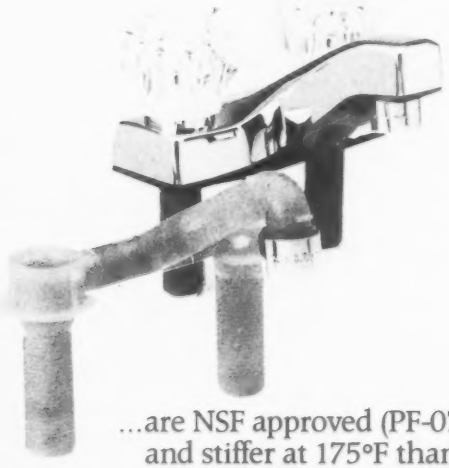

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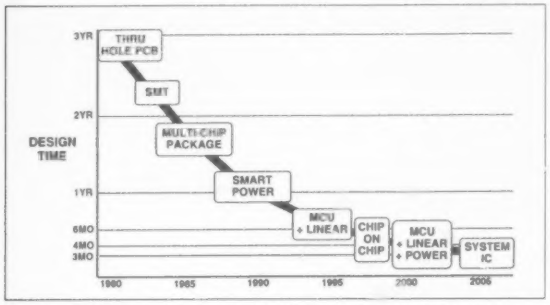
semiconductors for eight of the top 12 automotive OE control units), and for the auto electronics industry.

Speaking at the recent "Horizons" meeting in Austin, Texas, where Motorola mapped out its plans for the various electronics market segments, Williams and his Automotive group colleagues discussed the current state of the industry, today's technology and what they see coming in the future. The following is a snapshot of the "Horizons" meeting, including Motorola-supplied chart information.

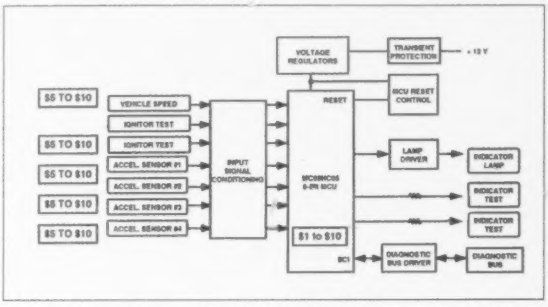
• Faster is best: The electronics industry needs to get new products to market in *half* the time it now takes, says Greg Williams. The solution is more teamwork at the systems level, not just on the components level.

• Future product cycles: Will be 6-12 months total – and faster. Toyota's new 16-bit microprocessor, based on a Motorola 68000-series core, was a sub-36 month project which utilized a 'systems team.' Products will be developed on a 'feature' basis and driven by marketing. The complexity of some electronics products will increase by as much as a factor of 50, compared with their current counterparts, says Motorola. Reducing engine emissions will continue to eat up R&D budgets and engineering time.

• How to work with Motorola: Develop cross-functional teams to lay out

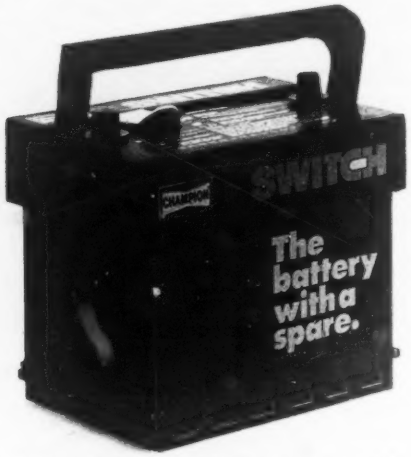


System integration through year 2005. Note reduced cycle times.



Cost of some airbag system components, according to Motorola.

glass-reinforced resins...



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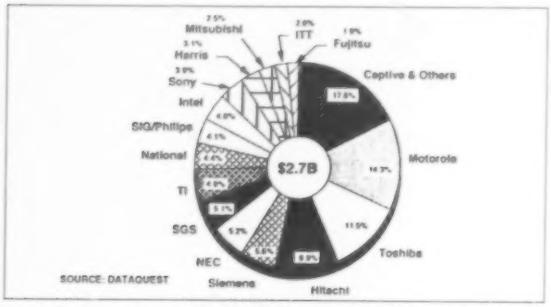
the vision and integrate the functions needed for a program, reduce pin count, coordinate the car group with active and passive component suppliers, and bring the 'manufacturing guys' in upstream.

Motorola has applied this approach with Ford, and with GM and Delco Moraine in developing the ABS VI system.

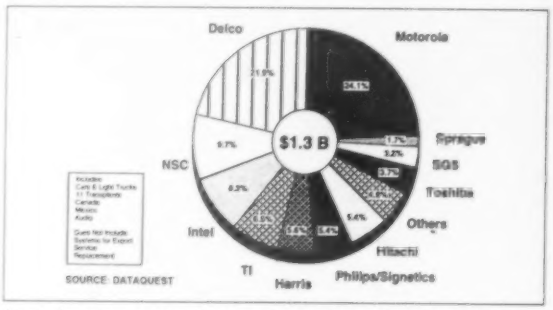
• Dealing with Japan's *kieretsus*: This is key to getting into Japan to do business long-term, says Greg Williams. "Suppliers don't have to give up anything," he maintains. "The Japanese are looking for new, attractive technology that they don't have." He points to his company's 400% growth in Japan due to ventures with Nippondenso, which will come from 16-bit technology and Smart-MOS, as well as expanded deals with the Europeans (ABS controllers and diagnostics).

Quality is "more important than product" in this regard, Williams notes. This includes management relations and response to customer-related problems. Motorola adopted Toyota's quality process model in 1988, and developed benchmarks and a best-in-class process portfolio in each major phase (concept, design, manufacturing, service).

Local design capability and the quality of service, including JIT production, are also 'musts,' even if manufacturing is to be done by a Japanese



World automotive semiconductor market share (1989). Source: Dataquest.



North American automotive semiconductor market share (1989), including transplants, Canada, Mexico, audio.

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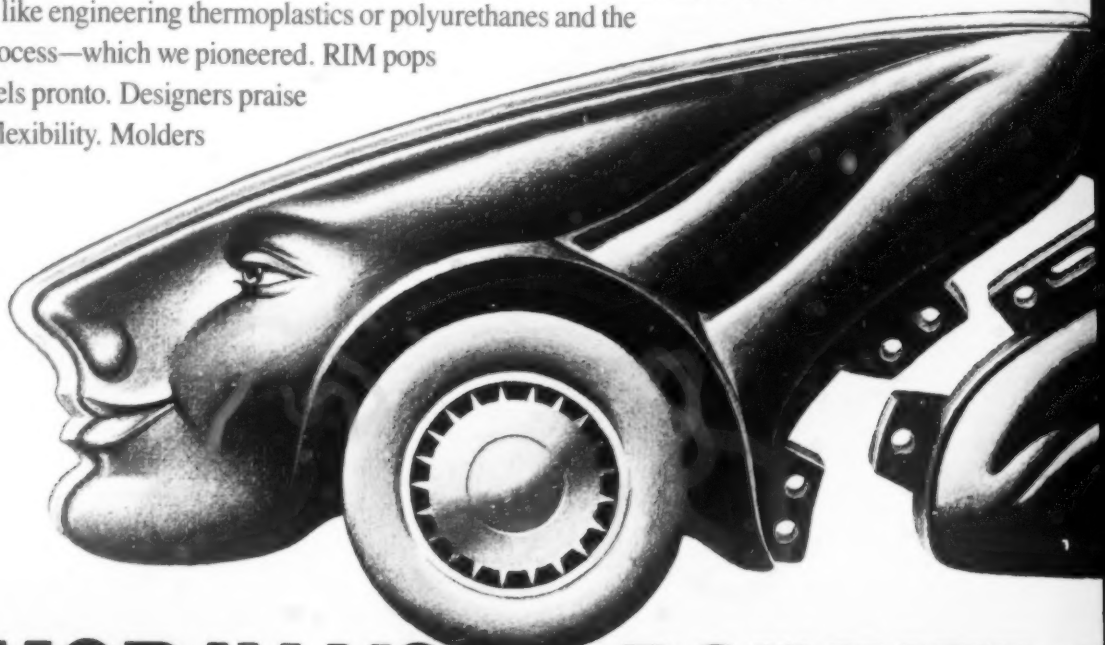

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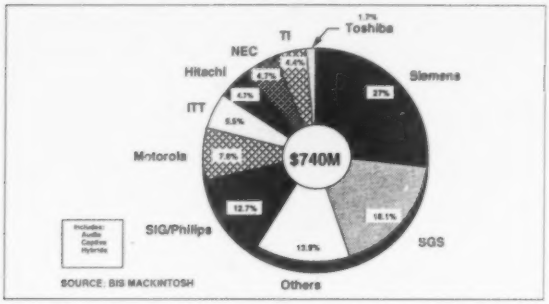
joint-venture partner. To improve communications, American design engineers should take courses in conversational Japanese, as Williams has done himself.

• Dealing with the transplants: Motorola has an automotive focus and design team in Japan. Some of the company's design is done in Tokyo but can be produced in any plant. "Get qualified in Japan and supply globally," advises Williams, who says that supplier qualification is equally rigorous in Japan and in the US.

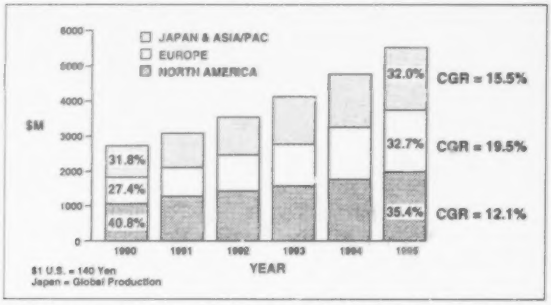
• Design wins: Focus on long-term projects – "next-generation stuff," Williams says. Cross-functional teams should target major technology and identify opportunities at the design stage.

• Electric vehicles: Power is still a major difficulty in designing these vehicles. There are also too many connectors and solder joints, so multiplexing may be one solution; 'smart power' and more functionality may be others. Motorola's initial interest in electric vehicles is in power motor drives, says Williams. Tire pressure sensors could also be a big potential market here, as electrics will probably run high-pressure tires.

• What's exciting? To Greg Williams, three major areas – sensors, electric vehicles, and intelligent vehicle highways systems, along with DSP. AI



European automotive semiconductor market share (1989), including audio, captive and hybrids. Source: BIS Mackintosh.



World automotive semiconductor market, 1990-1995, showing compounded growth (CGR).

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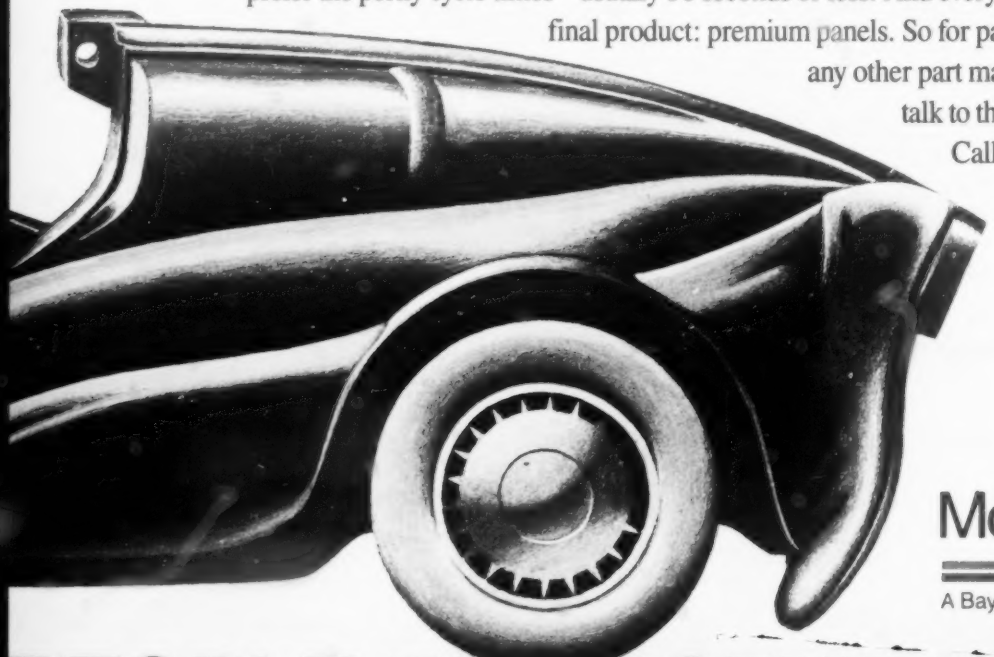

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